CMPT 129 - D100 Introduction to Computing Science and Programming for Mathematics and Statistics

**Instructor(s):** Janice Regan

**SFU Burnaby**

**Calendar Objective/Description:**
A second course in computing science and programming intended for students studying mathematics, statistics or actuarial science and suitable for students who already have some background in computing science and programming. Topics include: a review of the basic elements of programming; use and implementation of elementary data structures and algorithms; fundamental algorithms and problem solving; basic object-oriented programming and software design; computation and computability and specification and program correctness.

**Instructor’s Objectives:**
This course is a rigorous introduction to computing science and computer programming aimed at students who have already completed a basic computing science or programming course. Students will learn fundamental concepts of computing science as well as develop basic skills in software development, with application to problems in mathematics and allied areas.

**Prerequisites:**
CMPT 102 or CMPT 120. Students with credit for CMPT 125 or 135 may not take this course for further credit. Quantitative

**Topics:**
- C/C++ review of ifs/loops, basic input and output using C++
- Writing simple functions, arguments passed by value and by reference
- File input and output, error handling,
- 1 and 2-D arrays
- Pointers, dynamic allocation of arrays, using arrays as function arguments
- Recursion
- Linear and binary search, algorithms for methods of sorting, Empirical comparison of sorting methods
- Introduction to classes
- Data structures (some as examples of classes), stacks, hash tables, linked lists

**Grading:**
5% labs `20% assignments 30% midterms 45% final
Students must attain an overall passing grade on the weighted average of exams in the course in order to obtain a clear pass (C- or better).

**Required Books:**

**Academic Honesty Statement:**
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).